

23

structure or resource. Similarly, structures and functionality presented as a single resource may be implemented as separate resources. These and other variations, modifications, additions, and improvements fall within the scope of embodiments of the present disclosure as represented by the appended claims. The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense.

The invention claimed is:

1. A system comprising:

one or more computer processors;

one or more computer memories;

a set of instructions incorporated into the one or more computer memories, the set of instructions configuring the one or more computer processors to perform operations for automatically managing a set of memory chunks within the one or more computer memories at runtime for a computer application, the operations comprising:

receiving a set of entities from the computer application, each of the set of entities including a set of components, wherein each component of the set of components has one type of a set of types;

classifying the set of entities into a set of archetypes, each archetype representing a different count of the set of components or a different combination of types of the set of components relative to other archetypes of the set of archetypes;

based on a determination that one of the set of archetypes corresponds to a new archetype, building a new memory chunk, adding the new memory chunk to the set of memory chunks, and populating the new memory chunk, wherein the populating of the new memory chunk includes adding data from the set of components included in one or more entities of the set of entities that are classified under the new archetype, the adding of the data including contiguously adding the data to ends of a set of component data arrays included in the new memory chunk, each of the set of data arrays included in the new memory chunk corresponding to a respective component of the set of components included in the one or more entities that are classified under the new archetype.

2. The system of claim 1, wherein each component data array of the set of component data arrays is contiguous with a next component data array of the set of component data arrays.

3. The system of claim 1, the operations further comprising based on a determination that the one of the set of archetypes corresponds to an existing archetype, populating an existing memory chunk of the set of memory chunks, wherein the populating of the existing memory chunk includes adding data from the set of components included in one or more entities of the set of entities that are classified under the existing archetype, the adding of the data including contiguously adding the data to ends of a set of component data arrays included in the existing memory chunk, each of the set of data arrays included in the existing memory chunk corresponding to a respective component of the set of components included in the one or more entities that are classified under the existing archetype.

4. The system of claim 1, wherein the adding of the new memory chunk to the set of memory chunks ensures that the set of memory chunks includes at least one memory chunk for each of the set of archetypes.

5. The system of claim 1, including receiving a first list of components, a second list of components, and an additional

24

set of instructions for modifying components within the first list of components, the operations further comprising:

searching the set of archetypes for one or more matching archetypes that includes all the components from the second list of components; and

using the additional set of instructions to modify one or more of the components included in the one or more matching archetypes based on a correspondence between the one or more components and the first list of components.

6. The system of claim 1, wherein each of the set of entities is created as a result of a game event occurring within the application.

7. The system of claim 1, the operations further comprising:

receiving a notification of a deletion of an entity of the set of entities;

removing data corresponding to the entity from each of the set of data arrays included in a memory chunk of the set of memory chunks corresponding to the entity; and ensuring that the memory chunk is contiguously packed by moving data corresponding to an additional entity from an end of each of the set of data arrays to locations of the removed data corresponding to the entity.

8. The system of claim 1, the operations further comprising:

determining that an entity of the set of entities within a first archetype has been modified;

based on a determination that the modified entity corresponds to an additional new archetype, adding the additional new archetype to the set of archetypes, building an additional new memory chunk for the additional new archetype, populating the additional new memory chunk with data from the set of components included in the modified entity, and deleting data corresponding to the modified entity from the first archetype;

based on a determination that the modified entity corresponds to an existing second archetype in an existing memory chunk populating the existing memory chunk with data from the set of components included in the modified entity, and deleting data corresponding to the modified entity from the first archetype.

9. The system of claim 1, wherein the data from each of the set of components included in the one or more entities of the set of entities that are classified under the new archetype is extracted from variables of an object-oriented-programming object representing the component.

10. A computer-implemented method comprising:

receiving a set of entities from a computer application, each of the set of entities including a set of components, wherein each component of the set of components has one type of a set of types;

classifying the set of entities into a set of archetypes, each archetype representing a different count of the set of components or a different combination of types of the set of components relative to other archetypes of the set of archetypes;

based on a determination that one of the set of archetypes corresponds to a new archetype, building a new memory chunk, adding the new memory chunk to the set of memory chunks, and populating the new memory chunk, wherein the populating of the new memory chunk includes adding data from the set of components included in one or more entities of the set of entities that are classified under the new archetype, the adding of the data including contiguously adding the data to